BIOLOGICAL INVESTIGATIONS OF THE DEEP SEA. 32.

ANOTHER NEW WESTERN ATLANTIC PLEUROTOMARIAN GASTROPOD[1]

FREDERICK M. BAYER
Institute of Marine Science, University of Miami

ABSTRACT

A new deep-water pleurotomarian gastropod from the vicinity of Guadeloupe, Lesser Antilles, is described as *Perotrochus pyramus*. This is the seventh species discovered in the western Atlantic, and the second to be shown to have a very low, broad turbiniform shell during intermediate stages of growth, becoming relatively higher as growth proceeds. Various aspects of the shell, sculpture, and progressive changes in shape are illustrated.

INTRODUCTION

In 1963, trawling operations aboard R/V GERDA in the Straits of Florida brought to light *Perotrochus amabilis*, the third western Atlantic pleurotomarian and the first new species of these animals to be discovered in that area for a century (Bayer, 1963). Subsequently, three more new species were described from West Indian waters, two of them collected by GERDA (Bayer, 1966).

Dredging operations conducted aboard GERDA in connection with marine geological investigations in the vicinity of Guadeloupe during July 1966 obtained a living pleurotomarian from depths of 540-648 meters. The specimen was collected by Dr. Roland Eichler of the Institut für Paläontologie, Friedrich-Wilhelm-Universität, Bonn, visiting investigator at the Institute of Marine Science, who brought it to my attention. Upon detailed examination, the shell proved to be perfectly distinct from those of all six species previously known from the West Indian region. In shape, it most nearly approaches *Perotrochus midas*, which lived at similar depths, and belongs to species-group B of *Perotrochus* (Bayer, 1966: 745) along with *P. midas*, *africanus*, *teramachii*, and sp. indet. (*teramachii* Habe *non* Kuroda). It differs in sculpture, color, and thinness of shell.

Although the animal was alive when collected, rocks in the geological dredge damaged the shell so the specimen is not perfect. The soft parts were not preserved but the operculum was saved. I am very much indebted to Dr. Eichler for the opportunity of studying this most interesting specimen, which is deposited in the type collection of the Division of Mollusks, United States National Museum. I am pleased to acknowledge the generous assistance of the scientific staff of the Division of Mollusks, U. S.

[1] Contribution No. 782 from the Institute of Marine Science, University of Miami.

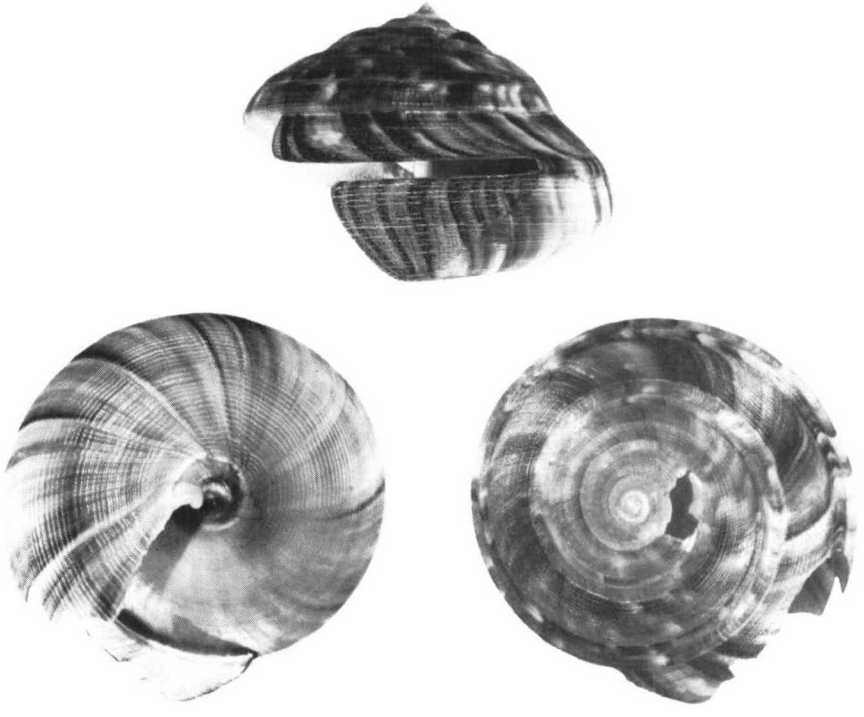


FIGURE 1. *Perotrochus pyramus*, n. sp. Holotype. Profile, basal, and apical views; profile view retouched to show contour of lip and slit. Approximately natural size.

National Museum, especially that of Dr. Joseph Rosewater, Curator in Charge, who willingly made his facilities available to me. This research has been supported by the National Geographic Society through a grant for investigations of deep-sea biology.

Perotrochus pyramus, n. sp.

Figs. 1-5

Material.—One specimen from La Désirade Straits, off Guadeloupe, Lesser Antilles, 16°17.6′N, 61°09.5′W, 540-648 meters, R/V GERDA, cruise G-6607 (D-1), 17 July 1966, coll. R. Eichler: HOLOTYPE, U. S. National Museum no. 677192.

Description.—The shell is of moderate size, low turbiniform, very thin and fragile. The shape of the shell is shown in Figure 1, of which the profile view has been retouched to restore the contour of the lip as indicated by growth lines and color pattern. The appearance of the damaged shell is

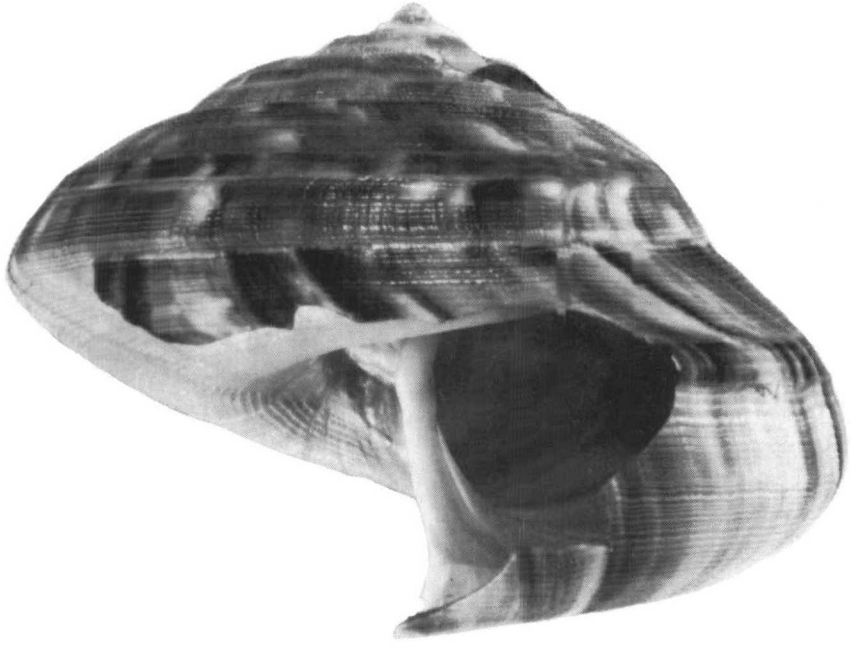


FIGURE 2. *Perotrochus pyramus*, n. sp. Holotype. Unretouched profile view showing damaged condition of outer lip.

shown in the enlarged and unretouched profile view given in Figure 2. Whorls 7 1/2; specimen probably is immature, but this cannot be verified as the soft parts were not preserved. The whorls are moderately inflated and the slope of the spire faintly convex so that it is somewhat cyrtoconoid. The base is distinctly convex and slopes gently into the umbilical depression around the columella. The aperture evidently is ovate. Even though the outer lip below the slit is broken away, the color pattern elsewhere on the body whorl shows that the edge of the lip above the slit projected moderately beyond the lower edge (Fig. 1), as is usual in *Perotrochus* except *P. amabilis*. Fortunately, the closed end of the slit is intact so the depth of the slit can be determined. It occupies 25 mm in a total circumference of 125 mm, hence one-fifth of the body whorl. The slit lies a little below the midpoint between suture and periphery, but because of the rather inflated base it has the appearance of being unusually high on the body whorl. The columellar lip is only slightly thickened but it has a distinct sigmoid flexure as in other species of *Perotrochus*.

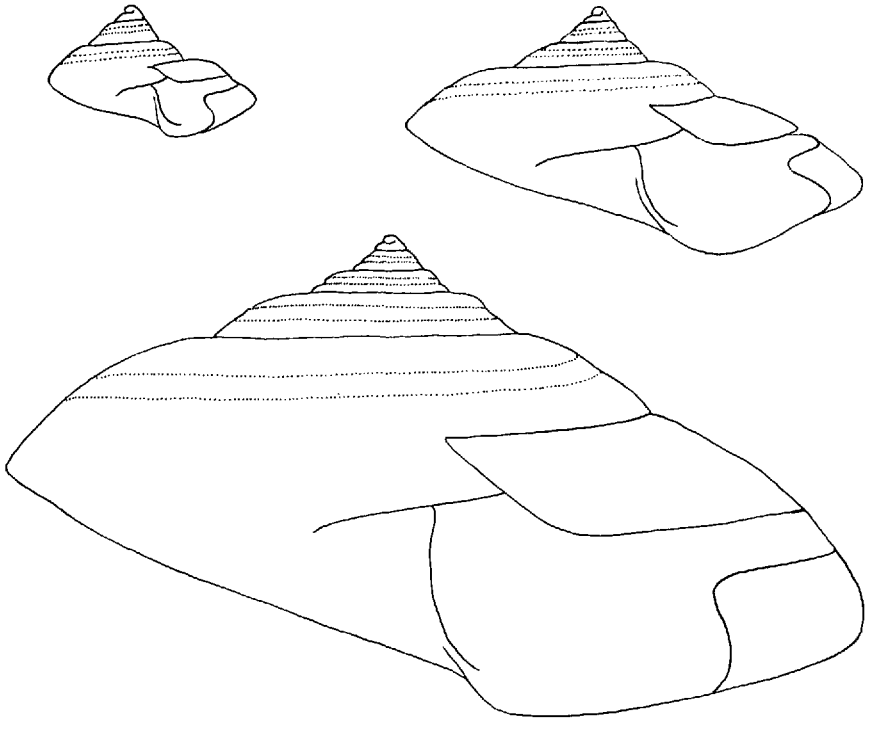


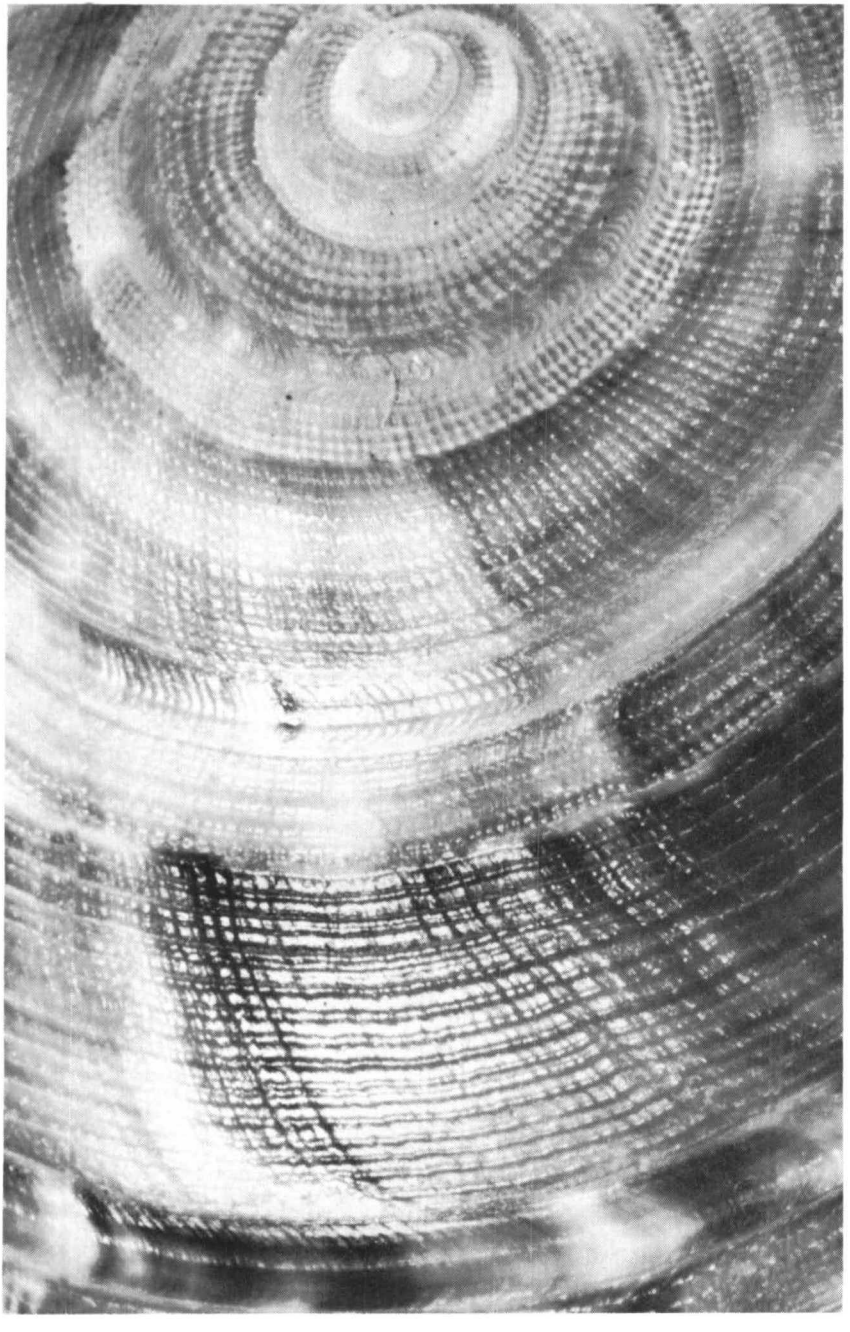
FIGURE 3. *Perotrochus pyramus*, n. sp. Holotype. Profiles of shell as it appeared with four, five, and six whorls. Traced from radiograph.

Initial angle of the spire 93°. The first three whorls are low turbiniform but in the fourth the shell begins to broaden and the fifth is rather broadly flared, somewhat depressed and carinate, resulting in a change in shape reminiscent of that in *Perotrochus midas* (Bayer, 1966: 746, Fig. 8). Through a break in the wall of the sixth whorl, the base of the fifth and its periphery can be seen, clearly revealing the shape of the shell at that stage. The profile of the shell as it appeared with four, five, and six whorls is shown in tracings (Fig. 3) made from a radiographic negative projected by a studio enlarger, in the same manner used to illustrate progressive changes in shape in *P. midas* (Bayer, 1966).

The ornamentation (Fig. 4) is rather weak, predominantly spiral, very faintly beaded; on the later whorls, the axial threads are so inconspicuous that they are little more than growth lines. On the earlier whorls, the

→

FIGURE 4. *Perotrochus pyramus*, n. sp. Holotype. Sculptural detail. × 6.8.



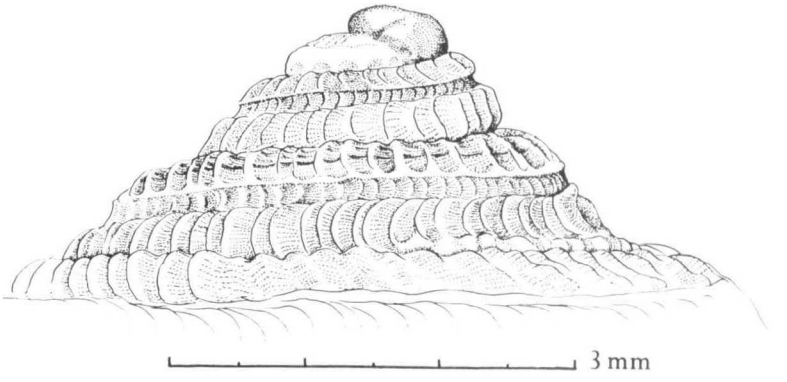


FIGURE 5. *Perotrochus pyramus,* n. sp. Holotype. Profile view of apex. Camera lucida drawing × 18.

axial sculpture is stronger relative to the spirals and the ornamentation here appears cancellated in the usual pleurotomarian fashion. On the body whorl, *i.e.*, the first half of the eighth whorl, 19 spiral cords occur between the suture and the fasciole, and 13 from the fasciole to the periphery; between the periphery and the columellar callus, the base has 48 spiral cords. On the seventh whorl there are 14 spiral cords above the fasciole, 11 below; on the sixth whorl, 10 above and 5 below; on the fifth whorl, 4 above and 2 below; on the fourth whorl, 3 above and 1 below.

Although the protoconch is somewhat eroded (Fig. 5), it is similar to that of *P. midas* and *P. lucaya* (Bayer, 1966: 752-753, Figs. 6, 7; 758-759, Figs. 11, 12). Following the one unsculptured whorl of the protoconch, the teleoconch is marked by curved collabral growth riblets above and below the fasciole, which shows the usual lunules curved in the opposite direction. The surface between the growth riblets is marked with fine striae, converging toward the aperture between the lunules but diverging in the growth increments above and below the fasciole. In the second whorl, three beads appear on the growth riblets above the fasciole and in the next whorl the beads become joined by raised spiral cords. Below the fasciole, a spiral does not intercalate between the fasciole and peripheral cord until the fourth whorl. The fasciole develops one weak median cord in the fifth whorl, and a second, less distinct, lying above the median one, appears in the sixth; on the body whorl, the median cord shows a groove which suggests that it was about to divide. The fasciole is flat and flush with the surface of the whorl, and it joins the adjacent shell in a very narrow, neat suture above and below. The margin of the slit is not flared out to form keels following the fasciole as is the case in *P. midas* and other species.

The color of the shell is reddish orange, darkest on the body whorl, with axial streaks of Venetian red and nebulous streaks of light orange, mostly axial on the body whorl but somewhat blotchy on the sixth whorl and rather inconspicuous on the earlier turns. The base is pale orange or cream with radial streaks of reddish orange. Interior of aperture nacreous except in the parietal region; the nacreous umbilical area is limited to the immediate vicinity of the columella.

The operculum is 10 × 11 mm in diameter, of the usual type, thin, horny, yellowish brown, almost circular, multispiral, with about 13 whorls (the innermost are difficult to discern). The thin, narrow margin of each whorl overlaps the following whorl.

Measurements.—Maximum diameter 48 mm (estimated); minimum diameter 45 mm; total height 34 mm; height of body whorl 28.5 mm; depth of slit along upper margin 25 mm; width of fasciole on body whorl 2 mm, on first half of seventh whorl 1.4 mm; distance from suture to fasciole, body whorl, 7.5 mm, fasciole to periphery 5 mm; distance from suture to fasciole, seventh whorl, 5 mm, fasciole to periphery 4 mm.

Comparisons.—This new species is quite distinct from *Perotrochus quoyanus*, *P. amabilis*, *P. lucaya*, and *P. gemma*, all of which are inhabitants of much shallower water. *Perotrochus pyramus* more closely resembles the deep-water species of *Perotrochus* group B: *teramachii* Kuroda, "*teramachii*" Habe (*non* Kuroda), *africanus* (Tomlin), and *midas* Bayer. As in *P. midas*, the shell changes shape from turbiniform to almost lenticular due to progressive broadening of the whorls, and then this trend is reversed so the spire is cyrtoconoid in the subadult or adult shell. In all the other species, the spire is either flat-sided or slightly coeloconoid. Only *P.* "*teramachii*" has similarly inflated whorls, and it would be very desirable to make radiographs of the specimen to determine any changes of shape during growth.

In *Perotrochus pyramus*, the sculpture becomes relatively weaker and predominantly spiral as the shell grows larger, but in *P. midas* it remains strong and retains the well developed axial component which produces a distinctly beaded appearance. The color of *P. midas* is clearly yellow, with pinkish and orange suffusion, whereas the ground color of *P. pyramus* is reddish orange with streaks of Venetian red and blotches of paler orange. In *P. midas*, the nacreous iridescence is clearly visible through the outer layer of shell, even at its great size, whereas the outer, colored prismatic layer in *P. pyramus* is more opaque and obscures the iridescence.

Geographical Distribution.—This new species was obtained very near the classic pleurotomarian localities at Guadeloupe and Barbados. The fact that it was not collected by the BLAKE and other research vessels that worked the Antillean region in the past is probably the result of the very

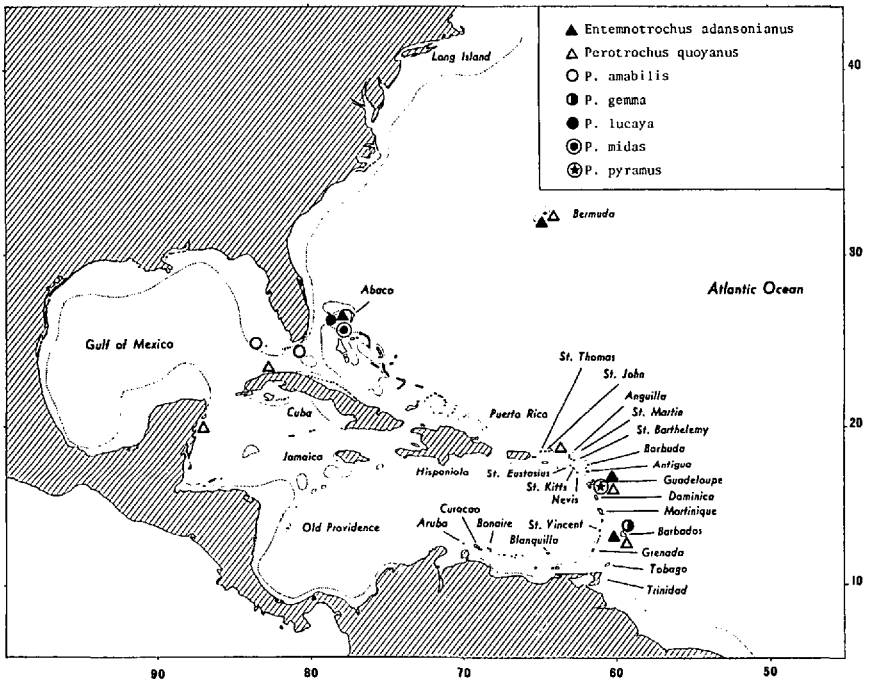


FIGURE 6. Distribution of pleurotomarians in the Western Atlantic.

rough bottom inhabited by pleurotomarians, which discouraged intensive sampling, together with the limited time spent by those vessels in the area.

At the present time, seven Recent species of Pleurotomariidae are known from the Western Atlantic (Fig. 6), six from Japan, one from the East Indies, and one from South Africa. As it is evident that our knowledge of the distribution of these animals is very fragmentary owing to inadequate sampling, zoogeographical speculations had best be deferred until more information has been obtained. However, it is a safe assumption that no living pleurotomarians inhabit the Mediterranean and at least the northern part of the Eastern Atlantic, as those areas have been intensively explored for many years. Their occurrence along the coast of tropical West Africa and the Pacific coast of Central America is an open and very provocative zoogeographical question.

SUMARIO

OTRO NUEVO GASTEROPODO PLEUROTOMARIO DEL ATLANTICO OCCIDENTAL

Se describe el séptimo pleurotomario del Atlántico Occidental bajo el nombre de *Perotrochus pyramus*. Esta especie se parece a *P. midas* Bayer

en su concha fina y baja pero la escultura de la misma es mucho más fina y predominantemente en espiral en lugar de con elevaciones en forma de cuentas y su color es naranja con vetas de rojo veneciano en vez de amarillo con nubes rosa y naranja. La concha tiene sólo 7-1/2 vueltas y es probablemente immadura, así que posiblemente alcance un tamaño mucho mayor cuando llegue a su completo desarrollo.

REFERENCES

BAYER, FREDERICK M.

1963. A new pleurotomariid gastropod trawled in the Straits of Florida by R/V GERDA. Bull. Mar. Sci., *13*(3): 488-492, fig. 1.

[1966.] New pleurotomariid gastropods from the Western Atlantic, with a summary of the Recent species. Bull. Mar. Sci., *15*(4): 737-796, figs. 1-35. [December, 1965; published January 31, 1966.]